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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/774,667	02/01/2001	Takashi Miida		3509

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EXAMINER	
SELBY, GEVELL V	
ART UNIT	**PAPER NUMBER**
2615	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/774,667	MIIDA, TAKASHI	
	Examiner	Art Unit	
	Gevell Selby	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ ~~Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)~~ Paper No(s)/Mail Date *11/20/02 & 2/15/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Takashi, JP 11-195778.

In regard to claim 1, Takashi, JP 11-195778, discloses a method of storing optically generated charges by optical signal in a solid state imaging device comprising the steps of:

(i)preparing the solid state imaging device comprising a unit pixel including:

(a)a photo diode (see figure 2, element 111) formed in a well region, and

(b)a field effect transistor (see figure 2, element 112) for optical signal detection formed in the well region adjacently to the photo diode, comprising

(1)a channel region (see figure 2, above 15a) formed on the surface layer of the well region between a source region and a drain region, and

(2)a carrier pocket (see figure 2, element 25) being provided in the well region under the channel region in the vicinity of the source region;

(ii)generating optically generated charges in the photo diode by light irradiation (see paragraph 36);

(iii)transferring the optically generated charges to the carrier pocket while accumulating movable charges of the same conductivity type as that of the source region over the entire channel region (see figure 3 and paragraphs 43-45);

(iv)storing the optically generated charges in the carrier pocket while accumulating movable charges of the same conductivity type as that of the source region over the entire channel region (see figure 3 and paragraphs 43-45).

In regard to claim 2, Takashi, JP 11-195778, discloses the method of storing optically generated charges by an optical signal in a solid state imaging device according to claim 1, wherein the field effect transistor for optical signal detection is a depletion type (see paragraph 38).

In regard to claim 3, Takashi, JP 11-195778, discloses the method of storing optically generated charges by an optical signal in a solid state imaging device according to claim 1, wherein movable charges of the same conductivity type as that of the source region are accumulated over an entire surface layer of the well region including the

channel region at least in the steps of transferring and storing (see figure 2 and paragraphs 43-44).

In regard to claim 4, Takashi, JP 11-195778, discloses the method of storing optically generated charges by an optical signal in a solid state imaging device according to claim 1, wherein a current is flowed to the field effect transistor for optical signal detection to read out a change in a threshold voltage after a period when the optically generated charges are transferred to the carrier pocket to be stored therein (see paragraph 64).

In regard to claim 5, Takashi, JP 11-195778, discloses a method of storing optically generated charges by optical signal in a solid state imaging device comprising the steps of:

(i)preparing the solid state imaging device comprising a unit pixel including

(a)a photo diode (see figure 2, element 111) provided with

(1)a first well region (see figure 2, element 15: region in the photo diode)of a first conductivity type, and

(2)an impurity region (see figure 2, element 17) of a second conductivity type formed on the first well region so that the photo diode has a buried structure, and

(b)a field effect transistor (see figure 2, element 112) for optical signal detection placed adjacently to the photo diode, provided with

(1)a second well region (see figure 2, element 15: region in transistor) of the first conductivity type connected to the first well region,

(2)a source region (see figure 2, element 16) of the second conductivity type formed on the second well region,

(3)a drain region (see figure 2, element 17a) of the second conductivity type formed on the second well region and connected to the impurity region,

(4)a channel region (see figure 2, element 15a: doped layer is in the channel region) formed on a surface layer of the second well region between the source region and the drain region,

(5)a channel doped layer (see figure 2, element 15a)of the second conductivity type formed on the channel region,

(6)a gate electrode (see figure 2, element 19) formed on the channel region by interpolating a gate insulating film, and

(7)a carrier pocket (see figure 2, element 25) of the first conductivity type being provided in the second well region under the channel region in the vicinity of a source region;

(ii)generating optically generated charges in the photo diode by light irradiation (see paragraph 36);

(iii)transferring the optically generated charges to the carrier pocket while accumulating movable charges of the second conductivity type over the entire channel region upon holding a potential of the gate electrode such that the channel region comes into an accumulation state where the channel region is filled with the movable charges (see figure 3 and paragraphs 43-45);

(iv)storing the optically generated charges in the carrier pocket while accumulating movable charges of the second conductivity type over the entire channel region upon holding a potential of the gate electrode such that the channel region comes into an accumulation state where the channel region is filled with the movable charges (see figure 3 and paragraphs 43-45).

In regard to claim 6, Takashi, JP 11-195778, discloses the method of storing optically generated charges by an optical signal in a solid state imaging device according to claim 5, wherein the field effect transistor for optical signal detection is a depletion type (see paragraph 38).

In regard to claim 7, Takashi, JP 11-195778, discloses the method of storing optically generated charges by an optical signal in a solid state imaging device according to claim 5, wherein movable charges of the second conductivity type are accumulated over an entire surface layer of the first and second well regions including the channel region at least in the steps of transferring and storing (see figure 2 and paragraphs 43-44).

In regard to claim 8, Takashi, JP 11-195778, discloses the method of storing optically generated charges by an optical signal in a solid state imaging device according to claim 5, wherein a current is flowed to the field effect transistor for optical signal detection to read out change in a threshold voltage after a period when the optically generated charges are transferred to the carrier pocket to be stored therein (see paragraph 64).

In regard to claim 9, Takashi, JP 11-195778, discloses the method of storing optically generated charges by an optical signal in a solid state imaging device according

to claim 5, further comprising a plurality of the pixels arranged in rows and columns (see figure 6, elements 101), wherein the optical signals are stored in the respective pixels by supplying different scanning signals to the mutually connected gate electrodes of the field effect transistors arrayed in the same row (see figure 6, elements 21a and 21b and paragraph 47), the mutually connected drain regions of the field effect transistors arrayed in the same row (see figure 6, elements 22a and 22b and paragraph 47), and the mutually connected source regions of the field effect transistors arrayed in the same column (see figure 6, elements 2a and 20b and paragraph 48).

In regard to claim 10, Takashi, JP 11-195778, discloses the method of storing optically generated charges by an optical signal in a solid state imaging device according to claim 9, wherein the storing of the optical signals into the respective pixels and the reading-out of the stored optical signals are controlled by a vertical scanning signal driving scanning circuit (see figure 6, element 102) for supplying a scanning signal to the gate electrodes in the raw (see paragraph 47), a drain voltage driving scanning circuit (see figure 6, element 103) for supplying a drain voltage to the drain regions in the raw (see paragraph 47), a signal output circuit (see figure 6, elements 28a&b, 29a&b, 105a&b) for storing voltages of the source regions in the column and further outputting an optical signal corresponding to the voltage of the each source region (see paragraph 48), and a horizontal scanning signal input scanning circuit (see figure 6, element 104) for supplying a scanning signal for controlling a timing of reading out the optical signal (see paragraph 48).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following art discloses storing optical signals in a solid state device:

US 5808,333,

US 4,630,091.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gevell Selby whose telephone number is 703-305-8623. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gvs

TUAN HO
PRIMARY EXAMINER